EXHIBIT L

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(12) United States Patent

Bergdale et al.

(54) METHOD AND SYSTEM FOR DISTRIBUTING ELECTRONIC TICKETS WITH DATA INTEGRITY CHECKING

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(58) Field of Classification Search

(56) References Cited

U.S. PATENT DOCUMENTS

4,193,114 A 3/1980 Benini 5,253,166 A 10/1993 Dettelbach 5,465,084 A 11/1995 Cottrell (Continued)

FOREIGN PATENT DOCUMENTS

EP 1439495 A1 7/2004 GB 2390211 12/2003 (Continued)

OTHER PUBLICATIONS

Starnberger et al., "QR-TAN: Secure Mobile Transaction Authentication," area, pp. 578-583, 2009 International Conference on Availability, Reliability and Security, 2009.

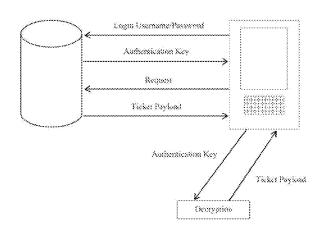
(Continued)

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(57) ABSTRACT

This invention discloses a novel system and method for distributing electronic ticketing to mobile devices such that the ticket stored on the device is checked for its integrity from tampering and the device periodically reports on ticket usage with a central server.

16 Claims, 22 Drawing Sheets



US 10,360,567 B2Page 2

	Relate	ed U.S. A	application Data	8,584,224		11/2013		
	a continuation	n-in-part	of application No. 13/901,243,	8,788,836 8,912,879		7/2014 12/2014	Hernacki Fyke	
	filed on May	23, 2013	3, now Pat. No. 9,239,993.	8,935,802 2001/0005840			Mattsson Verkama	
(60)	60) Provisional application No. 61/826,850, filed on May			2001/0003840		8/2001		
()	23, 2013.	r r		2001/0016825			Pugliese	
				2001/0037174 2001/0044324			Dickerson Carayiannis	
(51)			(2012.01)	2001/0051787	A1	12/2001	Haller	
	G06Q 20/32 G07B 15/00		(2012.01) (2011.01)	2001/0052545 2001/0054111		12/2001 12/2001	Serebrennikov Lee	
	G07D 15700		(2011.01)	2002/0010603	A1	1/2002	Doi	
(56)		Referen	ces Cited	2002/0016929 2002/0023027			Harashima Simonds	
	II S	PATENT	DOCUMENTS	2002/0040308	A1	4/2002	Hasegawa	
	0.5.	1711171	DOCOMENTS	2002/0040346 2002/0060246		4/2002 5/2002	Kwan Gobburu	
	5,559,961 A	9/1996 12/1996	Blonder	2002/0065713		5/2002	Awada	
	5,590,038 A 5,621,797 A	4/1997		2002/0065783 2002/0090930		5/2002	Na Fujiwara	
	5,777,305 A	7/1998		2002/0094090		7/2002	Tujiwara Iino	
	5,789,732 A 5,797,330 A	8/1998 8/1998	McMahon Li	2002/0126780			Oshima Kodaka	
	5,907,830 A	5/1999	Engel	2002/0138346 2002/0145505		10/2002		
	5,918,909 A 6,023,679 A	7/1999 2/2000		2002/0184539	A1	12/2002	Fukuda	
	6,023,688 A	2/2000	Ramachandran	2002/0196274 2003/0036929			Comfort Vaughan	
	6,085,976 A 6,175,922 B1	7/2000 1/2001		2003/0066883	A1	4/2003	Yu	
	6,251,017 B1	6/2001		2003/0069763 2003/0069827			Gathman Gathman	
	6,315,195 B1 6,373,587 B1		Ramachandran	2003/0093695		5/2003	Dutta	
	6,393,305 B1		Sansone Ulvinen	2003/0105641 2003/0105954		6/2003	Lewis Immonen	
	6,454,174 B1		Sansone	2003/0105969		6/2003		
	6,473,739 B1 6,484,182 B1	10/2002	Showghi Dunphy	2003/0154169		8/2003		
	6,493,110 B1	12/2002	Roberts	2003/0163787 2003/0172037		8/2003 9/2003		
	6,496,809 B1 6,685,093 B2	12/2002 2/2004		2003/0200184	A1	10/2003	Dominguez	
	6,775,539 B2	8/2004	Deshpande	2003/0229790 2003/0233276		12/2003 12/2003	Russell Pearlman	
	6,961,858 B2 6,997,384 B2	11/2005 2/2006	Fransdonk Hara	2004/0019564	A1	1/2004	Goldthwaite	
	7,017,806 B2	3/2006	Peterson	2004/0019792 2004/0030081		1/2004 2/2004	Funamoto Hegi	
	7,020,635 B2 7,024,807 B2	3/2006 4/2006	Hamilton Street	2004/0030091	A1	2/2004	McCullough	
	7,044,362 B2	5/2006	Yu	2004/0030658 2004/0039635		2/2004 2/2004		
	7,080,049 B2 7,090,128 B2	7/2006 8/2006		2004/0085351	A1	5/2004	Tokkonen	
	7,093,130 B1		Kobayashi	2004/0101158 2004/0111373		5/2004 6/2004		
	7,103,572 B1		Kawaguchi	2004/0111373		7/2004	Gehrmann	
	7,107,462 B2 7,134,087 B2		Fransdonk Bushold	2004/0148253 2004/0169589		7/2004 9/2004	Shin	
	7,150,045 B2	12/2006		2004/0186884			Dutordoir	
	7,158,939 B2 7,174,462 B2	2/2007	Goldstein Pering	2004/0210476		10/2004		
	7,191,221 B2	3/2007	Schatz	2004/0224703 2004/0250138		11/2004 12/2004	Schneider	
	7,263,506 B2 7,315,944 B2	1/2008	Lee et al. Dutta	2005/0059339		3/2005		
	7,386,517 B1	6/2008	Donner	2005/0060554 2005/0070257			ODonoghue Saarinen	
	7,392,226 B1 7,395,506 B2	6/2008 7/2008		2005/0108912	A1	5/2005	Bekker	
	7,493,261 B2	2/2009	Chen	2005/0109838 2005/0111723		5/2005 5/2005	Linlor Hannigan	
	7,520,427 B2 7,529,934 B2	4/2009	Boyd Fujisawa	2005/0116030	A1	6/2005	Wada	
	7,555,284 B2	6/2009	Yan	2005/0137889 2005/0204140		6/2005 9/2005	Wheeler Maruyama	G06O 20/045
	7,567,910 B2 7,587,502 B2	7/2009	Hasegawa	2003/0204140	711	5/2003	wardyama	713/175
	7,587,502 B2 7,617,975 B2	11/2009	Crawford Wada	2005/0212760		9/2005		
	7,711,586 B2	5/2010	Aggarwal	2005/0240589 2005/0246634			Altenhofen Ortwein	
	7,933,589 B1 7,967,211 B2	4/2011 6/2011	Mamdani Challa	2005/0252964	A1	11/2005	Takaki	
	8,010,128 B2	8/2011	Silverbrook	2005/0253817 2005/0272473		11/2005 12/2005	Rytivaara Sheena	
	8,016,187 B2 8,019,365 B2	9/2011 9/2011		2005/0272473		12/2005		
	8,370,180 B2	2/2013	Scott	2006/0120607	A1	6/2006	Lev	
	8,379,874 B1 8,457,354 B1	2/2013 6/2013		2006/0161446 2006/0174339		7/2006 8/2006		
	8,473,344 B1 8,473,342 B1		Roberts	2006/01/4339			Schaufele	
	8,583,511 B2	11/2013	Hendrickson	2006/0206728	Al	9/2006	Masuda	

US 10,360,567 B2 Page 3

(5.5)		-		2012(005755		2 (2012	2077.47.0000
(56)			ices Cited	2013/0065667			Nelson G07F 17/3223 463/25
	U.S.	PATENT	DOCUMENTS	2013/0065678	A1*	3/2013	Nelson G07F 17/3223 463/29
2006/0293929		12/2006		2013/0103200 2013/0124236		4/2013 5/2013	Tucker
2007/0012765 2007/0017979		1/2007	Trin uet	2013/0124230			Moberg
2007/0017979			Labrou	2013/0204647		8/2013	
2007/0032225			Konicek	2013/0214906		8/2013	
2007/0136213	A1		Sansone	2013/0279757			Kephart
2007/0150842			Chaudhri	2013/0307990		11/2013	
2007/0156443			Gurvey	2014/0018155	A1*	1/2014	Nelson G07F 17/3225
2007/0192590 2007/0215687			Pomerantz Waltman	2014/0045568	A1*	2/2014	463/25 Bennett, III G07F 17/323
2007/0213087			Chappuis	2014/0043300	AI	2/2014	463/17
2007/0265891		11/2007		2014/0086125	A1	3/2014	
2007/0271455	A1	11/2007	Nakano	2014/0100896			Du G06Q 10/02
2007/0273514		11/2007					705/5
2007/0276944	Al*	11/2007	Samovar G07C 9/00103	2014/0156318		6/2014	
2007/0283049	A 1	12/2007	709/225 Rakowski	2014/0186050		7/2014 9/2014	Oshima
2007/0283049			Robinson	2014/0279558 2014/0312606			Lister B41M 3/148
2008/0007388		1/2008		2014/0312000	711	10/2014	283/85
2008/0071587	A1	3/2008	Granucci	2015/0025921	A1	1/2015	
2008/0071637			Saarinen	2015/0084741	A1		Bergdale
2008/0120127			Stoffelsma	2015/0213443		7/2015	
2008/0120186 2008/0154623			Jokinen Derker	2015/0213660			Bergdale
2008/0191009			Gressel	2015/0286961	A1*	10/2015	Hamick G06Q 10/02
2008/0191909		8/2008		2015/0317841	Δ1	11/2015	705/5 Karsch
2008/0201212	A1		Hammad	2016/0042631		2/2016	
2008/0201576			Kitagawa	2016/0055605	A1	2/2016	
2008/0201769		8/2008		2016/0093127		3/2016	
2008/0227518 2008/0263077		10/2008	Wiltshire Boston	2017/0055157			Bergdale
2008/0288302		11/2008		2017/0372289 2018/0032997			Fitzsimmons Gordon G06Q 20/3224
2008/0308638		12/2008		2016/0032997	AI	2/2010	Goldon Good 20/3224
2009/0055288	A1*	2/2009	Nassimi G06F 21/10 705/16	FC	REIG	N PATE	NT DOCUMENTS
2009/0088077			Brown	GB	2417	358	2/2006
2009/0125387		5/2009			003187		7/2003
2009/0222900 2009/0284482		11/2009	Benaloh Chin	RU		931	6/2010
2010/0017872			Goertz	TW	200825		6/2008
2010/0044444		2/2010				348 A1	12/2007
2010/0082491			Rosenblatt		:008113 :009141		9/2008 11/2009
2010/0121766			Sugaya		011044		4/2011
2010/0201536 2010/0211452			Robertson D'Angelo G06Q 30/02		014043		3/2014
2010/0211432	AT	0/2010	705/14.38		014189		11/2014
2010/0219234	A1	9/2010	Forbes	WO 2	016105	322	6/2016
2010/0228563	A1	9/2010	Walker, Jr.				
2010/0228576		9/2010			OTF	HER PU	BLICATIONS
2010/0253470		10/2010		G !/ D			
2010/0268649	AI.	10/2010	Roos G06F 21/10 705/50				ill void until 3G wireless is ready; application being tested", all pages,
2010/0274691			Hammad	Dallaw Forth V			
2010/0279610		11/2010					uts Barcode Check-in and Board-
2010/0306718		12/2010		ing", all pages,	Comm	Web.com	, May 25, 2001.
2010/0308959 2010/0322485		12/2010 12/2010	Riddiford				s check-in with barcode", all pages,
2011/0001603		1/2011		m-Travel.com,			
2011/0040585			Roxburgh et al.				eck-in and Security Service", all
2011/0068165	A1		Dabosville	pages, MBusine			
2011/0078440	A1	3/2011					eck-In and Security Solution", all
2011/0136472			Rector	pages, aerias.co			o. 5, 2002. ards, R., "Mobile ticketing system
2011/0153495		6/2011					y" Jul. 11-13, 2005.
2011/0251910			Dimmick Miller				Im-Yeong Lee; Sang-Gu Byeon,
2011/0283241 2011/0307381		11/2011 12/2011					Authorization Ticket in Mobile
2012/0006891		1/2011					Aug. 11-13, 2010.
2012/0030047			Fuentes				twork to Launch Mobile Train-
2012/0092190		4/2012		Ticketing Appli	cation"	Cardline	, Feb. 4, 2011.
2012/0133484			Griffin	Ko Fujimura, Y	oshiaki	Nakajim	a, Jun Sekine: "XML Ticket: Gen-
2012/0136698		5/2012					Language" Proceedings of the 3rd
2012/0166298		6/2012					Commerce, Sep. 3, 1998.
2012/0245769			Creissels				A mobile ticket validation by VSS
2012/0330697	Al	12/2012	SHIRT	teach with time	stamp"	ıvıar. 28-	51, ZUU4.

US 10,360,567 B2

Page 4

(56) References Cited

OTHER PUBLICATIONS

Improvement of urban passenger transport ticketing systems by deploying intelligent transport systems, 2006. Machine English translation of JP2003-187272A from U.S. Appl. No. 13/901,243.

^{*} cited by examiner